

IN THE CLAIMS:

Please cancel claims 1, 3-13, and 15-16.

Claims 17-19 and 21-32 have been allowed and are represented with entries after prior amendment below:

1.(Cancelled)

2.(Canceled)

3.(Cancelled)

4.(Cancelled)

5.(Cancelled)

6.(Cancelled)

7.(Cancelled)

8.(Cancelled)

9.(Cancelled)

10.(Cancelled)

11.(Cancelled)

12.(Cancelled) .

13.(Cancelled)

14.(Cancelled)

15.(Cancelled)

16.(Cancelled)

17.(Previously amended) An apparatus for detecting the relative motion between two rotating members in a mechanical system, comprising:

two identical lasers for generating two identical light beams;

at least one first reflector located on a first rotating member positioned such that the reflection of a first light beam provided from a first of said two identical lasers forms an encoded portion of said first rotating member;

at least one second reflector located on a second rotating member positioned such that the reflection of a second light beam provided from a second of said two identical lasers forms an encoded portion of said second rotating member; and

one detector that detects Moirè fringes formed as a result of the interaction of images from said first and second encoded portions of said first and second rotating members, wherein said detector is located proximate to said mechanical system.

18.(original) The apparatus of claim 17 further comprising:

a sensor that analyzes a signal from said detection mechanism, thereby monitoring motion associated with said Moirè fringes, wherein said sensor is located proximate to said mechanical system.

19.(original) The apparatus of claim 18 further comprising:

at least two collimating lenses located in an optical path of said mechanical system, wherein said collimating lenses render said light beams from said light sources into highly collimated parallel light beams; and

at least two optical elements that operate on said light beams after passing through said at least two collimating lenses, thereby directing said light beams to intercept said encoded portions on said first and second rotating members.

20.(Cancelled)

21.(previously amended) The apparatus of claim 17 wherein light beams from said two Vertical Cavity Surface-Emitting Laser (VCSEL) units are rendered highly collimated by convex collimating lenses before said light beams intercept encoded portions of said first and second rotating members.

22.(original) The apparatus of claim 21 wherein said encoded portions comprise:

a transparent polymer film having parallel lines of opaque bar code imprinted on an upper surface of said transparent polymer film; and

wherein said parallel lines are spaced evenly, thereby forming a gap therebetween, wherein a width associated with said gap is identical to a width of said parallel lines, such that said transparent polymer film is adhesively attached to a rotating member; and

wherein said parallel lines are positioned at angle in relation to an axis of rotation of said rotating members.

23.(original) The apparatus of claim 22 wherein:

said transparent polymer film comprises a bar code when adhered to a rotating disk; and

wherein said bar code is adhered along a circumferential edge of said rotating member.

24.(previously amended) The apparatus of claim 17 wherein:

said first light beam intercepts said first encoded portion of said first rotating member at an angle of incidence of "a"; and

said second light beam, identical to said first light beam, intercepts said second encoded portion of said second rotating member at an angle of incidence of "a";

wherein said first light beam carries an image of a first bar code supported by said first encoded portion after being reflected from said first encoded portion of said first rotating member; and

wherein said second light beam carries an image of a second bar code supported by said second encoded portion after being reflected off said second encoded portion of said second rotating member.

25.(previously amended) The apparatus of claim 24 wherein the image from said first encoded surface interacts with the image of said second encoded surface after said light beams are reflected off said first and second rotating surfaces to produce Moirè fringes.

26.(original) The apparatus of claim 25 wherein Moirè fringes are observed on a sensor plate.

27.(original) The apparatus of claim 26 wherein said sensor plate is located at a Talbot distance from a point where said reflected light beams originate from said encoded surface of said first and second rotating members.

28.(previously amended) The apparatus of claim 26 wherein said detector is located on said sensor plate.

29.(original) The apparatus of claim 17 wherein said encoded portion of said rotating member is shaped to increase said reflected light in a particular direction.

30.(original) The apparatus of claim 17 wherein said encoded portion of a rotating member is shaped to form an optical encoder for encoding data representing performance characteristics of said mechanical system.

31.(original) The apparatus of claim 17 wherein said encoded portion of a rotating member is provided as a vernier on said rotating member to increase accuracy for sensing motion thereof.

32.(original) The apparatus of claim 17 wherein said encoded portion of said rotating member comprises measuring features recessed into a surface or edge of said rotating member